

Executive Summary

The City of League City has experienced tremendous residential, commercial and industrial growth in the past several years. The City is expected to continue to grow at an approximate 3.4% rate and more than double by ultimate buildout. This wastewater collection system model and master plan is the first significant update since 2002. One of the most significant improvements is the utilization of a dynamic model platform that can analyze time variation of flows and potential peak flow problems. In order to accurately identify any possible deficiencies and recommend future permanent wastewater system improvements, a major update to the wastewater model in a dynamic format and the wastewater master plan was necessary.

The City contracted CDM to develop a system wide plan to guide the City through the future wastewater infrastructure and operational challenges and ensure a reliable and high performing wastewater conveyance system.

ES.1 Project Objectives

The specific project objectives are to provide the City with a comprehensive wastewater master plan, addressing the following project needs:

- Plan to accommodate the significant growth anticipated.
- Ensure that the wastewater system meets TCEQ requirements and recommendations. This includes sewer line design, lift station capacity and adequate wastewater treatment plant capacity.

The remainder of the Executive Summary will provide a brief summary of the wastewater master plan report and the proposed recommendations.

ES.2 Project Approach

To simulate the City's wastewater system, a wastewater model was created using Bentley's SewerGEMS Sanitary V8i that incorporated GIS data provided by League City as the base model. Wastewater production scenarios were developed based on winter water billing data, existing and future population, existing wastewater flow data, and existing wastewater commitments. Meetings were held with City staff to ensure that connectivity issues were resolved accurately and existing problem areas were identified.

To validate the model, the existing scenario results were compared to wastewater treatment plant data for dry and wet weather to verify that the model was accurately representing the system.

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ES.3 System Characterization and Performance

The existing wastewater collection system functions adequately under dry weather conditions. **Figure ES-1** shows how much capacity of each gravity line is used during the peak time of dry weather. Problems arise under wet weather conditions for several areas in the system. **Figure ES-2** shows how much capacity of each gravity line is used during the peak time of a 2-year 24-storm wet weather event. Specific information regarding the severity of the existing wet weather issues, including the magnitude of the corresponding rainfall event, was not available. The wet weather problems identified by the City of League City are in the following areas:

- Dallas Salmon WWTP gravity service area.
- Webster Lift Station service area (trailer park)
- Bayou Brae Lift Station service area
- East Main Lift Station service area, specifically the Glen Cove Lift Station
- Butler Rd Lift Station service area, specifically Safari Lift Station (trailer park), Bay Colony MUD 14/15 Lift Station, and Clear Creek Village Lift Station

There are approximately 70 lift stations in League City, each with two or three pumps. The four largest lift stations are East Main, Smith Lane, Butler Road and Southeast General Benefit Hewitt Road, all contributing flow to the Dallas Salmon WWTP sewershed. The other much smaller Countryside WWTP is scheduled for decommissioning after the Southwest Water Reclamation Facility is operational in late 2012. At this point the flows to Countryside WWTP will be redirected to Southwest Water Reclamation Facility.

ES.4 Recommended Plan

The following outlines the future water supply scenarios created from the base of recommended improvements:

- 2020 Dry Weather Scenario. This includes the average dry weather demands and infiltration anticipated in 2020.
- 2020 Wet Weather Scenario. This includes the average dry weather demands and infiltration anticipated in 2020 as well as wet weather inflow and infiltration from a 2-year, 24-hour storm.
- Buildout Dry Weather Scenario. This includes the average dry weather demands and infiltration anticipated in buildout.
- Buildout Wet Weather Scenario. This includes the average dry weather demands and infiltration anticipated in buildout as well as wet weather inflow and infiltration from a 2-year, 24-hour storm.

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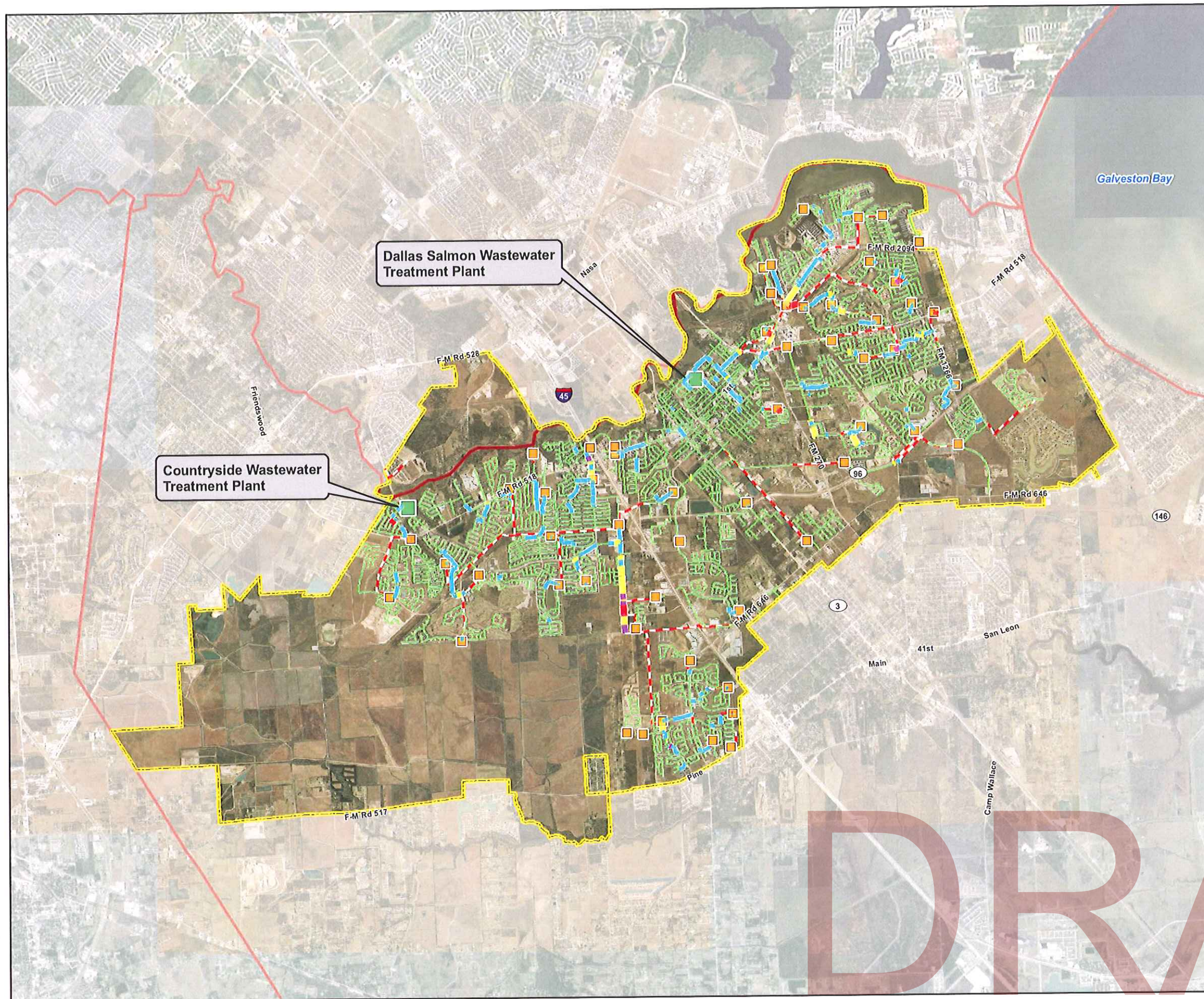


Figure ES-1
Dry Weather Flow Analysis
Existing Scenario
Gravity Sewers Used Capacity

City of League City Texas
Wastewater Master Plan 2011

Facility

- Wastewater Treatment Plant
- Lift Station

Gravity Line - Dry Weather Flow

- 81% - 100%
- 61% - 80%
- 41% - 60%
- 21% - 40%
- 0% - 20%

Force Main

League City City Limit



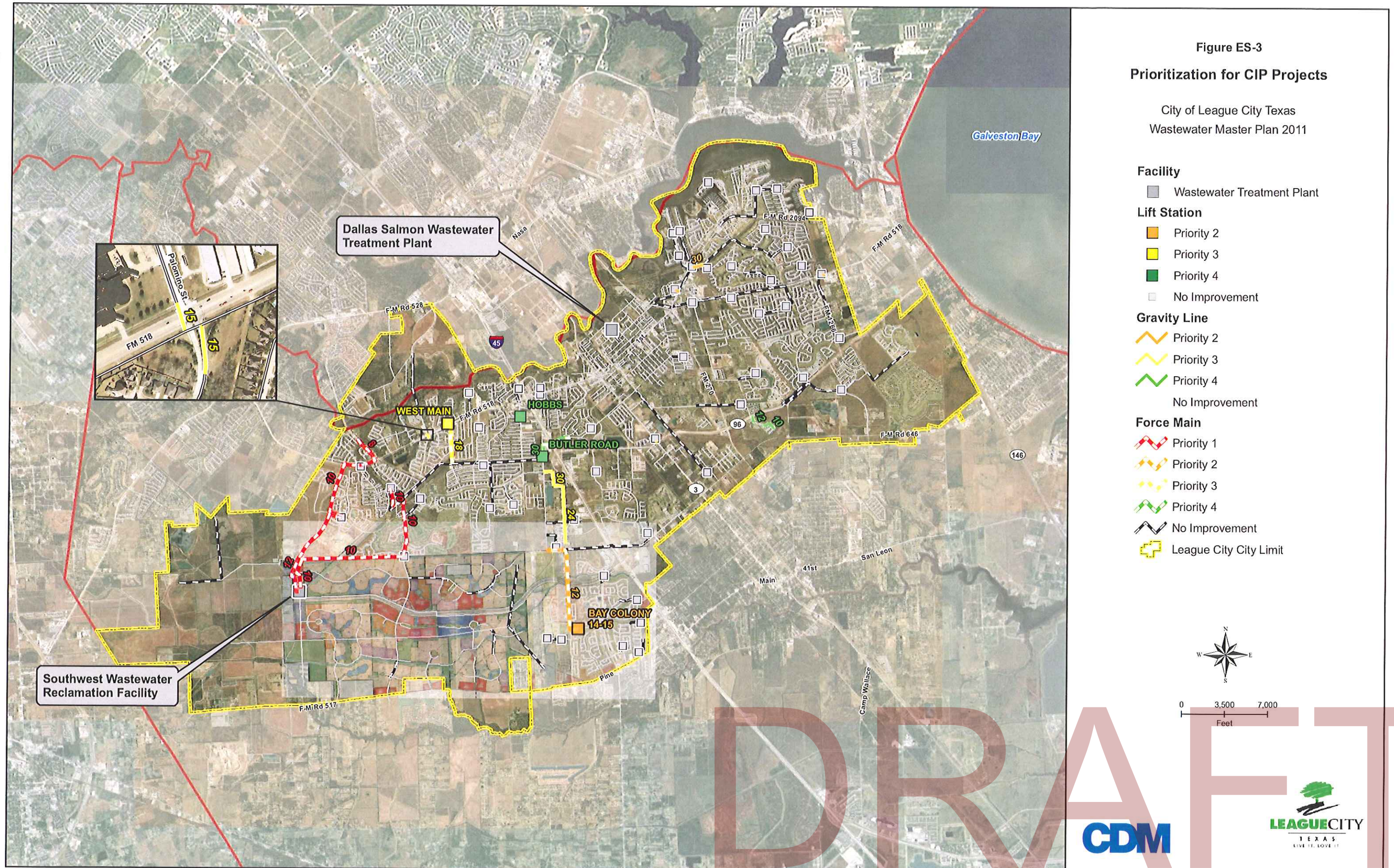
0 3,500 7,000
Feet

CDM



Figure ES-3
 Prioritization for CIP Projects

City of League City Texas
 Wastewater Master Plan 2011



ES.4.1 Development of CIP Projects

The developed scenarios results were analyzed based on established evaluation criteria. After identifying a problematic area during the peak dry or wet conditions, alternatives to alleviate overflows or surcharging in those areas were developed and evaluated utilizing the model. At the end of this analyses process, each scenario was ultimately able to operate with gravity lines at less than 80 percent capacity.

Once all of the improvements projects needed to pass the 2020 and buildout wastewater flows were compiled, they were categorized based on prioritization. For the newly identified projects, planning level cost estimates were also created.

ES.4.2 Project Prioritization

The projects were categorized into four different levels of priority. Table ES-1 details the evaluation criteria associated with each priority.

Priority Ranking	System Flow Condition	Criteria
Priority 1	All Conditions	Flow diversion to SWWRF
Priority 2	Wet Weather	Overflowing manholes
Priority 3	Dry Weather	Pipes surcharged
Priority 4	Wet Weather	Pipes surcharged

Table ES-1
Priority Ranking Criteria

Table ES-2 shows the identified CIP projects through ultimate buildout. Also shown are the planning level costs for each project as well as the scenario when the need for the project is first identified. Figure ES-3 shows the prioritization for all the proposed CIP projects.

Project ID	Priority	Project Title	Project Category	Recommended Scenario	Soft Cost (\$)	Total Project Cost (\$)
FA	1	Divert Countryside WWTP, Countryside 1 LS and Westover Park LS to SWWRF	Force main - New	Existing ¹	- ⁵	\$1,400,000
FB	1	Divert Countryside 2 LS, Magnolia Creek North, and Magnolia Creek South to SWWRF	Force main - New	Existing ¹	- ⁵	\$830,000
FE	2	Bay Colony 14-15 LS Force main	Force main - Improvement	Buildout ³	\$1,270,000	\$1,460,000

Table ES-2
CIP Projects Opinion of Probable Construction Cost

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Project ID	Priority	Project Title	Project Category	Recommended Scenario	Soft Cost (\$)	Total Project Cost (\$)
GA	3	New line along Calder Rd	Gravity Line - New	Existing ¹	\$2,710,000	\$3,110,000
FC	3	Bypass gravity line from MH 6408 to MH 1040 with 1 extended force main from Harbor Park 1 LS	Force main - Extension	2020 ²	\$110,000	\$130,000
GB	3	Improvement along Palomino Rd from MH 3383 to MH 3425 at FM518 and along Spring Landing from MH 3487 to MH 3419	Gravity Line - Improvement	Buildout ³	\$110,000	\$130,000
FD	3	West Main LS and Force main Improvement ⁴	Force main and Lift Station - Improvement	Buildout ³	- ⁵	\$1,830,000
FF	4	Butler Rd LS Force main Improvement	Force main - Improvement	Buildout ³	\$1,210,000	\$1,390,000
LA	4	Hobbs Rd Lift Station and Force main	Lift Station and Force main - New	Buildout ³	- ⁵	\$600,000
GC	4	Improvement along Lage Nicola Ln from MH 7443 to MH 7454 (10") and MH 7701 to MH 7703 (12")	Gravity Line - Improvement	Buildout ³	\$400,000	\$460,000
Notes: ¹ CIP projects required to address deficiencies predicted in the Existing Scenario ² CIP projects required to address deficiencies predicted in the 2020 Scenario ³ CIP projects recommended to address deficiencies predicted in Buildout Scenario (modeling did not assume an exact time frame for buildout analysis) ⁴ Engineering design has been completed ⁵ Costs developed by League City						

Table ES-2
CIP Projects Opinion of Probable Construction Cost - Continued

ES.4.2 Wastewater Treatment Plant Expansions

Preliminary results from the buildout scenarios for the ultimate treatment flows at the two WWTPs are shown in Table ES-3. The dry weather flows should not be confused with average daily flows which will include some rain events. Also, the peak flows are based on the 2-year, 24-hour design storm at this time.

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Wastewater Treatment Plant	Average Dry Weather Flow (gpm)	Peak Wet Weather Flow (gpm)
Dallas Salmon Wastewater Treatment Plant	9,100	17,000
Southwest Water Reclamation Facility	5,100	9,000

Table ES-3
Preliminary Flows Projected for WWTPs in Buildout Scenarios

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